CLAIMS

1. A free fall simulator, characterized in that it comprises:

- a lower compression chamber (22):
  - in the vicinity of whose lower periphery there open the outlets of a plurality of fans (24) arranged in a centripetal configuration, and
  - in whose upper tapered part there is placed a compression grid (30);
- a cylindroid chamber (36) delimiting a maneuvering space, which is located immediately above the compression chamber (22), and which is designed to be traversed by a homogenous flow of rising air having a speed gradient decreasing regularly from the bottom to the top; and
- a generally cylindrical superstructure which encloses at least the maneuvering chamber (14) of the simulator, which terminates in its upper part in a dome (12) which covers said maneuvering chamber of the simulator, and which is arranged to promote a downward circulation of the air leaving the maneuvering chamber toward the fan inlets.

2. The simulator as claimed in claim 1, characterized in that the inner surface of the compression chamber is shaped to generate a homogeneous air flow to ensure the stability of the operator in the maneuvering chamber.

3. The simulator as claimed in either one of claims 1 and 2, characterized in that the lower compression chamber (22) comprises a bottom part in the general shape of a cylindrical solid of revolution (26) extended upward by a truncated conical part (28).

4. The simulator as claimed in claim 3, characterized in that, in order to prevent the separation of the air

stream along the inner wall of the truncated conical part adjacent to the compression grid, said inner wall is provided with an annular bend (32) projecting toward the interior of the compression chamber (22).

5. The simulator as claimed in any one of claims 1 to 4, characterized in that said fans (24) open in the wall of the generally cylindrical bottom part, with a constant angular spacing.

6. The simulator as claimed in any one of claims 1 to 5, characterized in that the compression grid (30) mounted in the upper part of the lower compression chamber (22) is chosen to generate a pressure drop of approximately 150 Pa, in particular in the form of a grid having a mesh size of 500 mm x 500 mm.

7. The simulator as claimed in any one of claims 1 to 6, characterized in that the air speed at the inlet of the fans is of the order of 7 m/s and the air speed at the outlet of the fans is of the order of 40 m/s.

8. The simulator as claimed in any one of claims 1 to 7, characterized in that the cylindroid maneuvering chamber (36) comprises a generally cylindrical bottom part (38) which is extended upward by a generally diverging conical part (40).

9. The simulator as claimed in claim 8, characterized in that the angle formed by the walls of the generally diverging conical part of the cylindroid maneuvering chamber with the vertical is less than approximately 6°.

10. The simulator as claimed in any one of claims 1 to 9, characterized in that the cylindroid maneuvering chamber is fitted with a safety net (42, 44) in each of

its bottom and top parts.

11. The simulator as claimed in any of claims 1 to 10, characterized in that the cylindroid maneuvering chamber is provided with an additional comfort net (43) fixed removably to its periphery.

12. The simulator as claimed in any one of claims 1 to 11, characterized in that the wall of the median part of the cylindroid maneuvering chamber has at least one aperture opening into a closed access chamber (52) in the dome and delimiting an access platform (48).

13. The simulator as claimed in claim 12, characterized in that the access chamber (52) takes the form of a cylindrical solid of revolution.

14. The simulator as claimed in either of claims 12 and 13, characterized in that the upper part of the access chamber (52) has a curved connecting profile (54), with an inward concavity to promote the circulation of the air flows.

15. The simulator as claimed in any one of claims 12 to 14, characterized in that the additional comfort net (43) is placed substantially at the level of said access platform (48).

16. The simulator as claimed in any one of claims 12 to 15, characterized in that at least one peripheral net (56) allowing the operators to remain in the air flow is stretched over said aperture in the extension of the wall of the diverging conical part (40).

17. The simulator as claimed in claim 16, characterized in that it comprises two peripheral nets (56) which

overlap at least partially to allow the operators to access the maneuvering chamber.

18. The simulator as claimed in any one of claims 1 to 17, characterized in that the inner wall of the conical chamber (40) comprises a take-off and damping border (58) whose inner face extends in the extension of said inner wall of the conical chamber (40).

19. The simulator as claimed in any one of claims 1 to 18, characterized in that the cylindroid maneuvering chamber is provided at its upper free edge with a peripheral collar (46) intended to facilitate the outflow of air.

20. The simulator as claimed in any one of claims 1 to 19, characterized in that the speeds are distributed in the cylindroid maneuvering chamber as follows:
bottom part: approximately 70 m/s
median part: approximately 50 m/s
top part: near the limit lift speed of approximately 45 m/s.

21. The simulator as claimed in any one of claims 1 to 20, characterized in that the compression grid and the safety net positioned in the bottom part of the cylindroid maneuvering chamber are chosen to generate a total pressure drop of approximately 400 Pa.

22. The simulator as claimed in any one of claims 1 to 21, characterized in that the inner surface of the dome of said superstructure is provided with a central projection shaped in the form of a solid of revolution (50) to promote the circulation of air, said projection being centered on the axis of revolution of the cylindroid maneuvering chamber.

23. The simulator as claimed in claim 22, characterized in that said central projection in the form of a solid of revolution takes the general shape of a cone whose lateral surface is concave with its concavity directed toward the interior of said projection.